

# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

### Improvements relating to Beverage Dispensing Apparatus

We, GASKELL & CHAMBERS LIMITED, of Dalex Works, Coleshill Street, in the City of Birmingham, 4, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to beverage dispensing apparatus of the kind incorporating a tap controlled outlet to which the beverage is supplied from a source which is subjected to air or other gas under pressure.

With such apparatus there is a tendency for the beverage to be delivered in a frothy state and the object of the present invention is to provide means for minimising this tendency in a simple and convenient manner.

According to the invention means for incorporation in a beverage dispensing apparatus of the kind specified comprises the combination of a tubular body having a tapering bore through which the beverage is required to flow from the narrower to the wider end whilst being dispensed, a tapering plug axially movable within the bore and having its narrower end directed to the narrower end of the bore, and an abutment for limiting outward movement of the plug from the bore.

In the accompanying drawings Figures 1, 3 and 4 are sectional side elevations of three examples of the invention, and Figure 2 is cross-section through Figure 1.

In the example of the invention illustrated in Figure 1 there is provided a tubular body 5 having midway in its length a peripheral flange 5a and externally screw-threaded at each end. The body has a tapering bore 5b which at each end opens into a relatively short part of cylindrical form, and within the tapering bore is a tapering plug 6 which may be correspondingly tapered, but preferably has a lesser taper than the bore.

The end of the body part 5 incorporating the narrower end of the tapering bore is

adapted for connection to the source of pressurised beverage, whilst the opposite end is connected to the one end of a short tubular part 7 the opposite end of which is adapted for connection preferably directly but alternatively indirectly, to the dispensing tap (not shown). A portion of the tubular part 7 fits within the cylindrical part of the bore at the adjacent end of the body and in the bore of the tubular part 7 (which is cylindrical) is a shoulder 7a which forms an abutment for the wider end of the plug 6. The wider end of the plug 6, which is located within the tubular part, is of open-ended hollow formation and has in its periphery a plurality of apertures 6a, the edges of the apertures remote from the wider end of the plug being chamfered as at 6b to provide a smooth flow path for the beverage as will be described.

The arrangement is such that when the tap is opened to dispense beverage the pressure of the beverage moves the plug 6 outwardly from the tapering bore until its outer end contacts the abutment shoulder 7a. In this position beverage can flow through the constricted annular passage between the tapering bore and plug. Since this annular passage is of gradually increasing cross-sectional area after the initial constriction, frothing of the beverage is minimised. The beverage flows from the annular passage through the peripheral apertures 6a to the centre of the hollow end of the plug and thence to the tap. When the tap is closed the back pressure acting on the plug moves it further into the tapering bore to a position in which it seats in the manner of a non-return valve and prevents the beverage from returning to the source of supply.

In the example of the invention illustrated in Figure 3 the abutment is adjustable, so as to provide for the positive movement of the plug 6 onto its seating. Conveniently the abutment may be formed by a cam 8 secured to the inner end of a rotatable spindle 9 radially mounted within a tap body 10 connected to

the outer end of the tubular part 7. The spindle 9 is rotatably mounted in a pair of bushes in a lateral extension 10a of the tap body, and is adapted to be rotated by a handle 11 at its outer end. In order to retain the spindle at any desired angular setting a packing may be firmly clamped between the pair of bushes by means of a screw cap 12 engaging the outer end of the lateral extension 10a so as to restrain rotation of the spindle. The profile of the cam is so shaped that it can form an abutment for the plug 6 at any position between a position in which the plug is seated upon the tapering bore in the body and the position admitting of the desired maximum rate of flow of beverage.

In Figure 4 an example of the invention is shown in which the tap includes an axially movable closure member 13 which serves as the abutment for the plug 6. In this construction the tap body 10 is connected directly to the tubular body 5 and the tubular part 7 is omitted. Conveniently the tapering plug 6 has formed in its wider end a screw-threaded axial recess which is engaged by an externally screw-threaded sleeve 14, and within the sleeve is slidably accommodated a stem 15 secured to the closure member 13 of the tap. The arrangement is such that as the tap is opened to move the closure member 13 from its seating 16 abutment between the closure member and the outer end of the sleeve 14 causes the plug to move further into the tapering bore 5b. By

adjusting the setting of the sleeve 14 in the recess in the plug the setting of the plug relative to the closure member can be adjusted, and to maintain a given setting a lock-nut 17 is provided on the sleeve which can be tightened against the adjacent end of the plug.

What we claim is:—

1. Means for incorporation in a beverage dispensing apparatus of the kind specified comprising the combination of a tubular body having a tapering bore through which the beverage is required to flow from the narrower to the wider end whilst being dispensed, a tapering plug axially movable within the bore and having its narrower end directed to the narrower end of the bore, and an abutment for limiting outward movement of the plug from the bore.

2. Means as claimed in Claim 1 in which the abutment is movable so as to provide for the positive movement of the plug into the bore.

3. Means as claimed in Claim 1 in which a closure member of the tap serves as the abutment.

4. Means for incorporation in a beverage dispensing apparatus comprising the combination and arrangement of parts substantially as described with reference to Figures 1 and 2 or Figure 3, or Figure 4 of the accompanying drawings.

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#### PROVISIONAL SPECIFICATION

#### Improvements relating to Beverage Dispensing Apparatus

We, GASKELL & CHAMBERS LIMITED, of Dalex Works, Coleshill Street, in the City of Birmingham, 4, a British Company, do hereby declare this invention to be described in the following statement:—

This invention relates to beverage dispensing apparatus of the kind incorporating a tap controlled outlet to which the beverage is supplied from a source which is subjected to air or other gas under pressure.

With such apparatus there is a tendency for the beverage to be delivered in a frothy state and the object of the present invention is to provide means for minimising this tendency in a simple and convenient manner.

According to the invention means for incorporation in a beverage dispensing apparatus of the kind specified comprises the combination of a tubular body having a tapering bore through which the beverage is adapted to flow from the narrower to the wider end whilst being dispensed, a tapering plug located within the bore, and an abutment for limiting outward movement of the plug from the bore.

In one example of the invention there is provided a tubular body having midway in its length a peripheral flange and externally screw-

threaded at each end. The body has a tapering bore which at each end opens into a relatively short part of cylindrical form and within the tapering bore is a tapering plug which may be correspondingly tapered, but preferably has a lesser taper than the bore.

The end of the body part incorporating the narrower end of the tapering bore is adapted for connection to the source of pressurised beverage, whilst the opposite end is connected to the one end of a short tubular part the opposite end of which is adapted for connection preferably directly, but alternatively indirectly, to the dispensing tap. A portion of the tubular part fits within the cylindrical part of the bore at the adjacent end of the body and in the bore of the tubular part (which is cylindrical) is a shoulder which forms an abutment for the wider end of the plug, which is located within the tubular part, is of open-ended hollow formation and has in its periphery a plurality of apertures, the edges of the apertures remote from the wider end of the plug being chamfered to provide a smooth flow path for the beverage as will be described.

The arrangement is such that when the tap is opened to dispense beverage the pressure of

the beverage moves the plug outwardly from the tapering bore until its outer end contacts the abutment shoulder. In this position beverage can flow through the constricted annular passage between the tapering bore and plug. Since this annular passage is of gradually increasing cross-sectional area after the initial constriction, frothing of the beverage is minimised. The beverage flows from the annular passage through the peripheral aperture to the centre of the hollow end of the plug and thence to the tap. When the tap is closed the back pressure acting on the plug moves it further into the tapering bore to a position in which it seats in the manner of a non-return valve and prevents the beverage from returning to the source of supply.

In another example of the invention the abutment is adjustable, so as to provide for the positive movement of the plug onto its seating. Conveniently the abutment may be formed by a cam secured to the inner end of a rotatable spindle mounted with the tubular part which may be integral with the dispensing tap. In this example the plug need not have a hollow portion and is desirably rounded at its wider end to provide a smooth flow path for the beverage. The spindle is rotatably mounted in a pair of bushes in a lateral extension of the tubular part, and is adapted to be rotated by a handle at its outer end. In order to retain the spindle at any desired angular setting a packing may be firmly clamped between

the pair of bushes so as to restrain rotation of the spindle by means of a screw cap engaging the outer end of the lateral extension. The profile of the cam is so shaped that it can form an abutment for the plug at any position between a position in which the plug is seated upon the tapering bore in the body and the position admitting of the desired maximum rate of flow of beverage.

Where the invention is to be incorporated in a dispensing apparatus having a tap which includes an axially movable closure member co-operating with a seating, then the closure member may form the abutment for the tapering plug. Conveniently the tapering plug has formed in its wider end a screw-threaded axial recess which is engaged by an externally screw-threaded sleeve, and within the sleeve is slidably accommodated a stem secured to the closure member of the tap. The arrangement is such that as the tap is opened to move the closure member from its seating between the closure member and the outer end of the sleeve causes the plug to move further into the tapering bore. By adjusting the setting of the sleeve in the recess in the plug the setting of the plug relative to the closure member can be adjusted, and to maintain a given setting a lock-nut is provided on the sleeve which can be tightened against the adjacent end of the plug.

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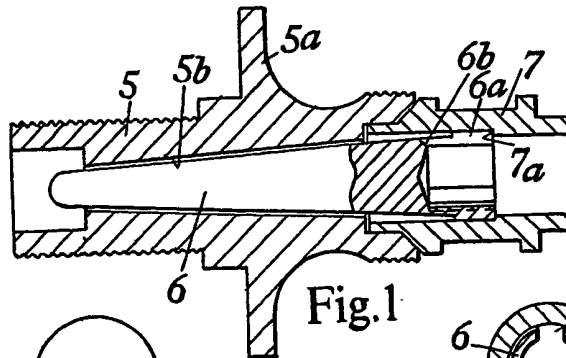


Fig.1

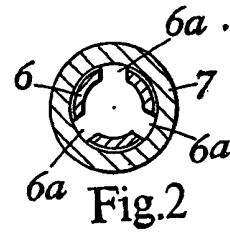


Fig.2

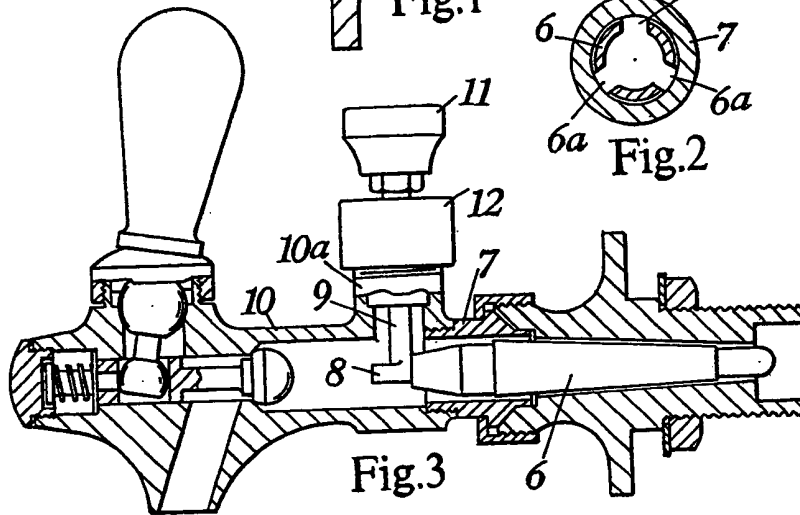


Fig.3

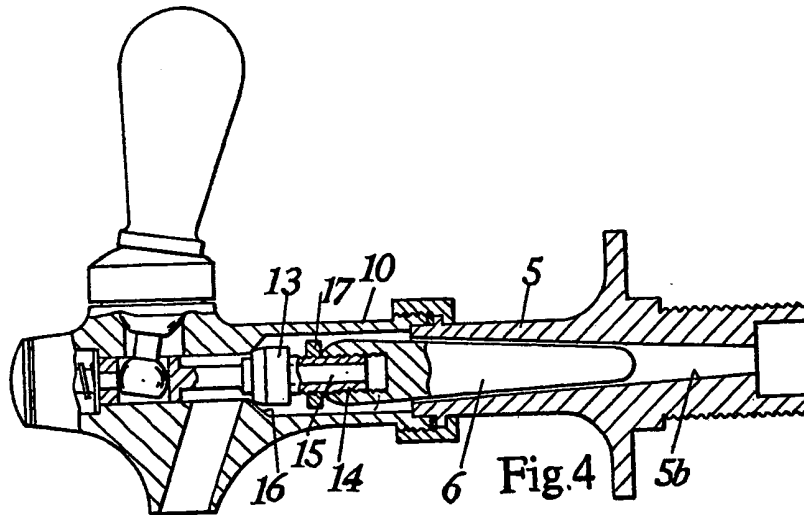


Fig.4